MODELS

BTI 85 G
BTI 100 G

INSTALLATION AND USER INSTRUCTION

UNITED KINGDOM / IRELAND

HOT WATER STORAGE HEATERS

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Read these installation instructions first before installing the appliance. Carefully read the user instructions before igniting the appliance. Failure to follow these instructions may lead to risk of explosion and/or fire and could cause material damage and/or bodily harm. Installation and commisioning should be carried out by a qualified competent installer. The type of gas and the value at which the appliance is set standard in the factory are registered on the rating plate. The appliance may only be installed in a room if this room meets the ventilation requirements.

A.O. SMITH ACCEPTS NO RESPONSIBILITY FOR WARRANTY, SERVICE AND/OR PRODUCT LIABILITY IN CASE OF UNAUTHORISED ALTERATIONS, PRODUCT MODIFICATIONS OR REPAIR.

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1. GENERAL

1.1 Description of the appliance

Construction of the water heater is in accordance with the European standard for gas heated water storage heaters for sanitary application (EN89). The appliance thus meets the European Directory for Gas Appliances and is therefore entitled to carry the CE-marking. It is an open flued appliance without ventilator and with a flue gas down draught safeguard, a Thermal Reflux Safeguard (TRS) (category B_{11BS}). The water heater is suitable for a maximum working pressure of 8 bar. The water heater tank is manufactured from low carbon sheet steel and is glasslined on the inside. In addition the tank is fitted with a magenesium anode as extra protection against corrosion. A thick, CFC-free, PU insulation layer covered in a steel jacket reduces unnecessary heat loss. When the appliance is filled with water it continuously is under water pressure. As hot water is drained from the tank, cold water is added immediately. Four flue baffles have been placed in the flue tube to improve heat tranfer. The flue gasses pass their heat on to the water by means of radiation and convection. The exhaust of the flue gasses is realized by natural thermal draught (see figur 1).

Dead legs on a hot water installation are undesireable. Where possible they should be avoided. When the inclusion on the system of a dead leg is unavoidable the following restrictions should be applied:

- for pipes not eceeding 19 mm. inside diameter; maximum length of dead leg permitted 12 metres;
- for pipes exceeding19 mm. but not exceeding 25 mm. inside diameter; maximum lenght of dead leg 7,5 metres;
- for pipes with an inside diameter exceeding 25 mm. maximum length of dead leg 3 metres.

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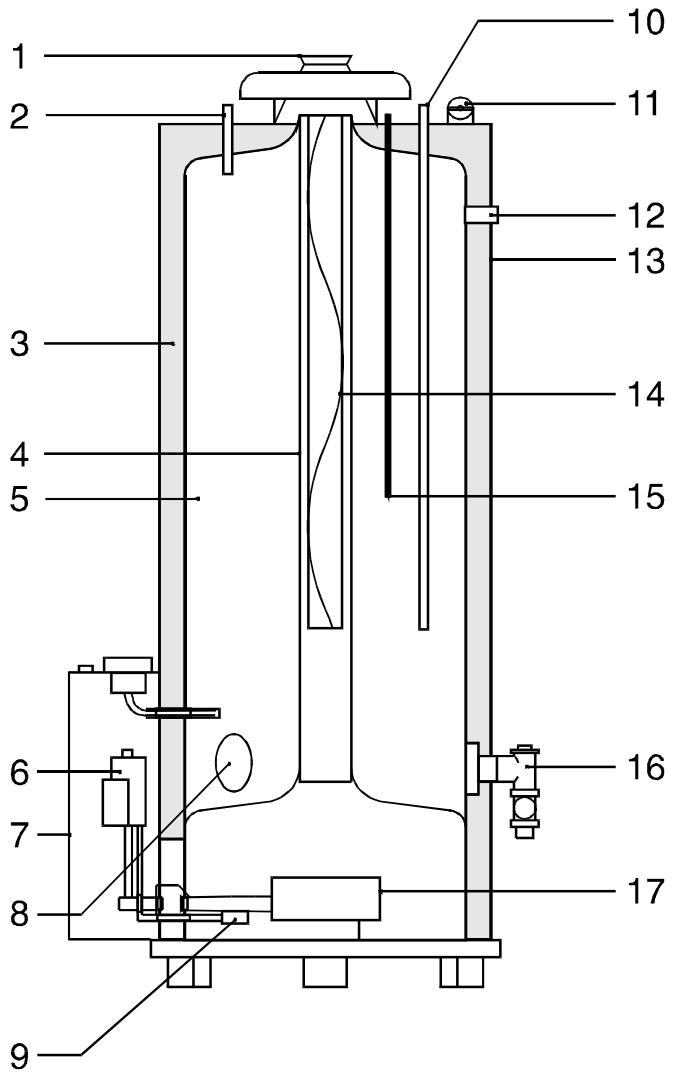

Figur 1 - Cross section of the heater

1) Draught diverter
2) Hot water outlet
3) Insulation
4) Flue tube
5) Glass lined tank
6) Gas valve and spark ignition
7) Control panel
8) Inspection cover plate
9) Intermittent pilot burner and flame probe
10) Cold water inlet
11) Combustion products discharge safety device
12) T&P valve connection
13) Outer casting
14) Flue baffle
15) Magnesium anode
16) Drain valve and secondary return connection
17) Main burner

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1.2 Technical safety equipment

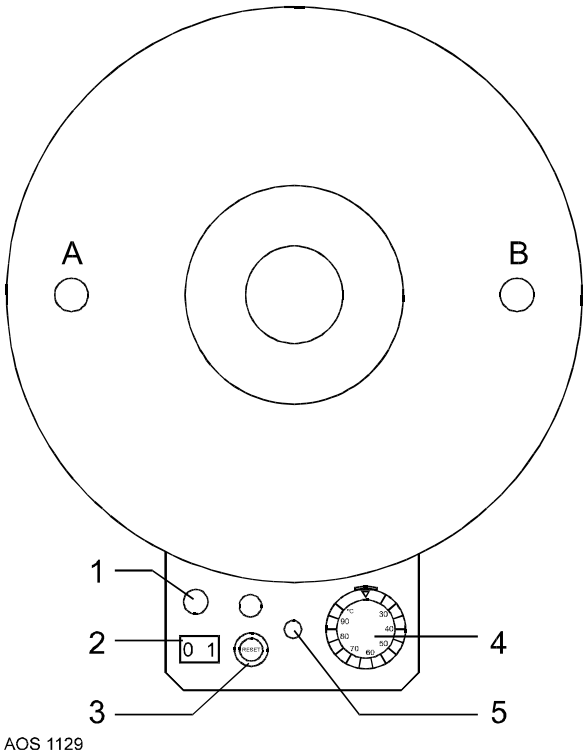
1.2.1 Gas control valve

The water heater is equipped with a gas control wich regulates the flow of gas to the burner. The gas block is equipped with a safety valve, gas valve and burner control (on a standard natural gas setting). To ensure improved ignition the gas control valve opening mechanism is fitted with a delay (softlite).
The gas control block is suitable for gasses from the first, second and third gas family. The maximum inlet pressure is 60 mbar.

The automatic incandescent ignition (hot surface) ensures that the burner ignites as soon as there is a demand for heat.

1.2.2 Control panel

Temperature control for the water heater is housed in the control panel (See figur 2). For safety purposes, heaters are always fitted with two thermostats: a control thermostat is adjustable between 40 °C and 80 °C and a safety thermostat 90 °C. The control panel is fitted with an ON/OFF switch (I/0). At setting ”I”, the gas control is activated on the basis of heat demand from the control thermostat. At setting ”0” the heater is switched off.



Figur 2 - Top view of the heater

A) Hot water outlet
B) Cold water inlet
1) Electrical connection
2) ON/OFF switch
3) Ignition controller reset button
4) Control thermostat knob
5) Safety thermostat reset button

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1.2.3 Operation of the storage water heater.

Normal operation

When there is a demand for heat a waiting period of about 1 second elapses before the built-in spark generator and pilot gas valve are switched on. The ignition sparks ignite the pilot burner and the resulting flame is detected by the ionisation electrode. Almost immediately after the pilot flame is detected, sparking stops and the main gas valve is openend. The main burner is lit by the pilot flame. The unit is now in operation. When the temperature of the water in the unit reaches the temperature that is set with the thermostat, the thermostat switches and disconnects the electrical heat demand signal to the burner controller. The gas valves are then closed.

Ignition failure

If the flame is not established within the safety period the automatic ignition controller locks out. The safety period is about 25 seconds. Lock-out is indicated by the lamp in the RESET-button on the control panel. The unit has to be manually reset by pushing the reset button. If the flame is lost during normal run, the automatic ignition controller repeats the start sequence.

1.2.4 Combustion products discharge safety device

The heater has been fitted with a combustion products discharge safety device. It is the function of the safety device to prevent flue gases from the water heater entering the room where the water heater has been placed, instead of passing through the flue to outside atmosphere. The gas supply is disconnected as soon as the device is activated by hot gases flowing over the sensor. After the cause of the re-entry of flue gases has been traced the device can be put back into operation by pressing its reset button. If this failure occurs frequently, this indicates that the flue suffers from down draught conditions. It is recommended that a competent person carry out the necessary remedial action.

Important

The combustion products discharge safety device should never be put out of operation. Re-entry of flue gases to the building could be harmful and cause poisoning or death.

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1.3 Technical information

1.3.1 Dimensions

These water heaters are only suitable for a flue tube with minimal the announced diameter (dimension G).

Dimensions	BTI 85	BTI 100
A	1585	1780
B	1450	1640
D	645	675
F	770	775
G	130	130
K	340	340
L	355	370
M	1505	1685
N	1505	1685
P	210	210
R	285	285
S	1280	1460
V	410	410
1	Cold water inlet	
2	Hot water outlet	
3	Gas control	
4	Drain valve	
5	T&P relief valve tapping	
6	Clean out	

All dimensions are given in mm. (rounded off on 5mm). See figur 3.

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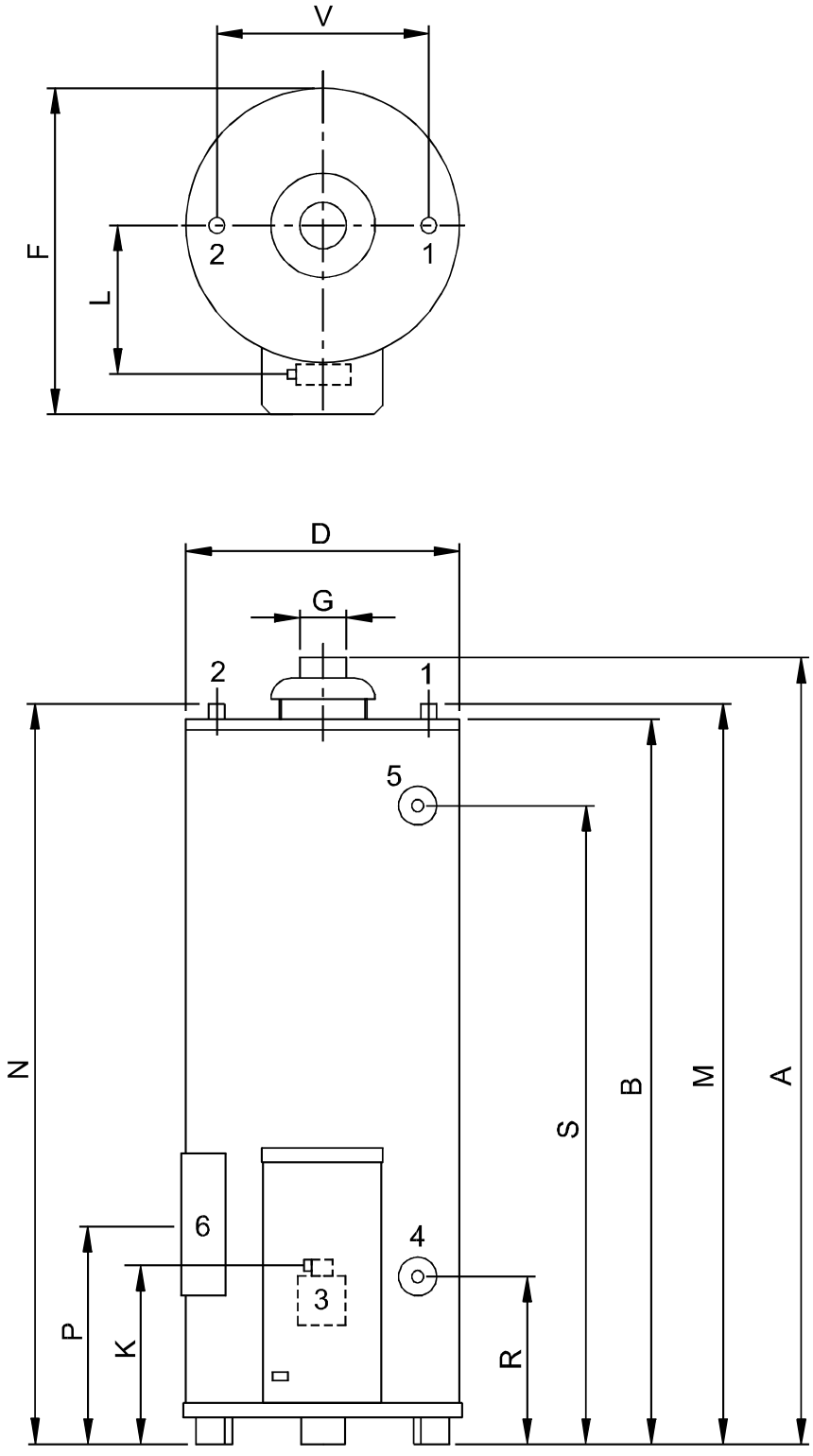

Figur 3 - Dimensions

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1.3.2 Technical data device category: II_{2H3+}

DESCRIPTION	unit	BTI 85	BTI 100
DATA NATUREL GAS G20 - 20 mbar			
Nominal capacity	kW	19.2	20.4
Nominal load (gross)	kW	25.1	26.7
Supply pressure	mbar	20	20
Burner pressure	mbar	12.0	7.9
Gas consumption *	m^3/h	2.40	2.50
Diameter main orifice	mm	3.90	4.50
Diameter pilot orifice	mm	0.56 / 0.41	0.56 / 0.41
Heating time ΔT= 45K	min	46	58
DATA BUTANE G30 - 30 mbar			
Nominal load (gross)	kW	24.5	26.0
Nominal capacity	kW	19.2	20.4
Supply pressure	mbar	30	30
Gas consumption *	kg/h	1.8	1.9
Diameter main orifice	mm	2.30	2.35
Diameter pilot orifice	mm	0.23	0.23
DATA PROPANE G31 - 37 mbar			
Nominal heat input (upper valvue)	kW	22.9	24.9
Output	kW	17.9	19.5
Inlet pressure	mbar	37	37
Gas consumption *	kg/h	1.6	1.8
Diameter main orifice	mm	2.30	2.35
Diameter pilot orifice	mm	0.23	0.23
GENERAL			
Storage capacity	litres	278	372
Water connections**	-	1-11.5 NPT	$1^1/_4$-11.5 NPT
Gas connection	-	$Rp^1/_2$	$Rp^1/_2$
Drain valve	-	$^3/_4$"-14NPT	$^3/_4$"-14NPT
Anode	-	$^3/_4$"-14NPT	$^3/_4$"-14NPT
T&P plug	-	$^3/_4$"-14NPT	$^3/_4$"-14NPT
Maximum operating pressure	bar	8	8
Empty weight	kg	122	149

* Gas consumption at 1013,25 mbar and 15 °C

** For a leak proof sealed connection European coupling pieces can be used on the NPT connection nipples with a pipe thread of ISO 228/1

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Electrical connection

Electrical supply	Frequency	Electrically fused to
220/240 V AC	50 Hz	5A

Ionisation current.

The minimal ionisation current is 0.9 micro-Amperes DC. Below this current the burner controller will assume no flame present. When in normal operation, the ionisation current wil be about 1.2 to 1.3 micro-Amperes DC when only the pilot flame is burning. (Adjust the main burner pressure to zero to be able to measure under this condition) With pilot- and main burner in operation, the ionisation current will be about 6.0 and 6.3 micro-Amperes DC.
Ionisation current can be measured by connecting a universal-meter in series in the connection to the ionisation electrode. Make sure to measure in Direct Current; Alternating Current in fact gives no information about the system's behaviour.

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2. FOR THE INSTALLER

2.1 Installation instructions

This water heater must be fitted in a location which will permit the provision os an approved flue system and adequate ventilation.

A service clearance of 15 cm at the sides and rear of the unit and 60 cm at the front of the unit should be allowed for ease of servicing. Adequate distance must be allowed between the top of the unit and any obstruction or ceiling to allow the flue baffle and anode to be inspected, cleaned or in the case of the anode replaced if necessary.

The water heater must stand on a level surface resistant to heat, insulted in accordance with local bylaws and Building Regulations 1985, with sufficient strength to support the weight of the unit when full of water.

This water heater must not be installed in a bathroom, bedroom or in a cupboard opening on to such rooms. This water heater must not be installed in any area where flamable materials are used or stored.

Insufficient ventilation may give rise to a risk of fire, explosion or suffocation. If in doubt consult the national and local regulations governing the installation of gas appliances or your British gas sevice department.

2.1.1 Installation

The installation of this water heater should be carried out by a suitably qualified competent person. It is a criminal offence for unqualified persons to install gas equipment.

Installation should be carried out in accordance with all local authority and Building Regualions, Model Water Bylaws, bylaws of the local water supplier, Building Standards (Scotland) (Consolidation) Regulations and any relevant requirements of the Local Authority, local gas regions and the following British Standards (current editions):

For domestic applications:

BS 5440 - part 1 and part 2.
BS 5546 - Installation of gas hot water supplies for domestic purposes.
BS 6700 - Specifications for design, installation and maintenance of services supplying water for domestic use within buildings and their curtilages.
BS 6798 - Specification for installation of gas fired hot water boilers of rated input not exceeding 60 kW.
BS 6891 - Specification for installation of low pressure gas pipework of up to 28 mm in domestic premises.

For non-domestic applications:

BS 5400 - part 1 and part 2.
BS 6798 - Specification for installation of low pressure gas pipework of up to 28 mm in domestic premises.
CP 342 - Code of practice for centralised hot water supply part 2, buildings other than individual dwellings and the following additional Codes of Practice.
IM/2 - Purging procedures for non-domestic gas installations.
IM/5 - Soundness testing procedures for industrial and commercial gas installations.
IM/11 - Flues for commercial and industrial gas fired boilers and air heaters.
IM/16 - Notes on installation of pipework (excluding 25 mm and below).

Some chemicals produce vapours which can cause rapid failure of main- and pilotburners and storage tanks if they are drawn into the combustion air supply.

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Therefore if this water heater will be used to supply hot water to:

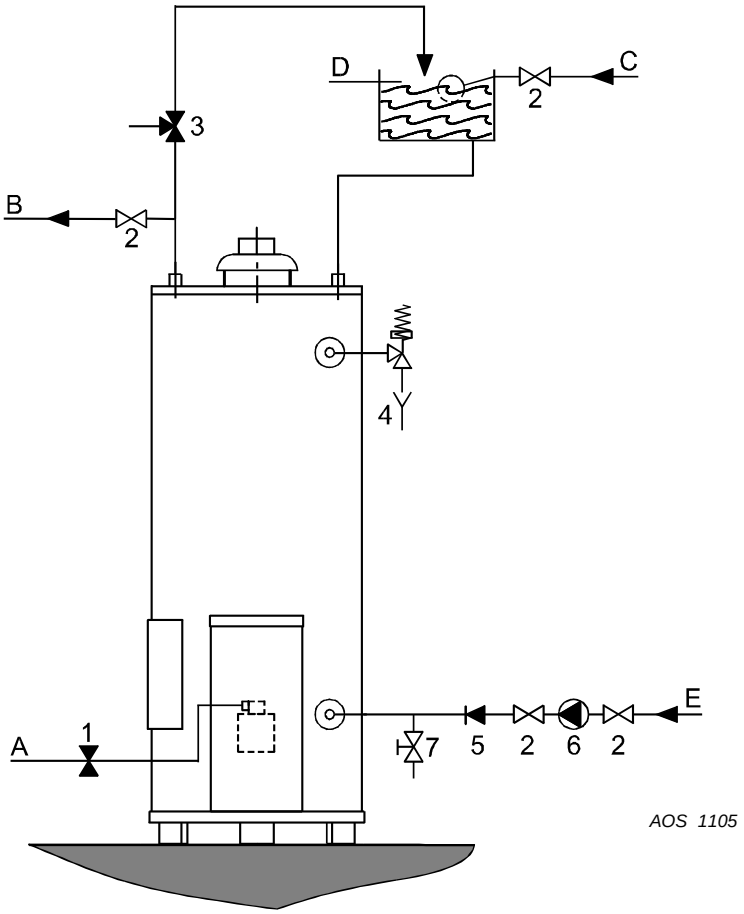
- hairdressers,
- dry cleaners,
- industrial degreasing processes or any other area where compounds containing halogens are used and stored, care should be ta ken that all primary and secondary air is drawn from outside atmosphere free of such contaminents.
  For futher advise contact A.O. Smith.

2.1.2 Water circulation system

A.O. SMITH water heaters are suitable for connection to vented, unvented and pumped pressurised systems. In each case appropriate valves and fittings should be used to ensure the system complies with the requirements of the water by laws, and appropriate building regulations.
When fitting it is essential the rules of 'good practice' are applied at all stages of installation.

Vented systems (See figur 4)

If the water heater is to be connected to a cold feed tank or cistern the hot water supply pipe must include an open vent which discharges over the cold feed cistern. The cold feed cistern must have an actual capacity of greater volume than the hourly recovery rate of the water heater(s) which it supplies. The minimum actual capacity is 50 gallons or 227 litres.



1) Manual gas valve
2) Stop valve
3) Three way valve
4) Safety valve
5) Non return valve
6) Circulation pump
7) Drain valve
A) Gas supply
B) Hot water outlet
C) Cold water inlet
D) Overflow
E) Return circulation loop

Figur 4 - Connection diagram vented systems

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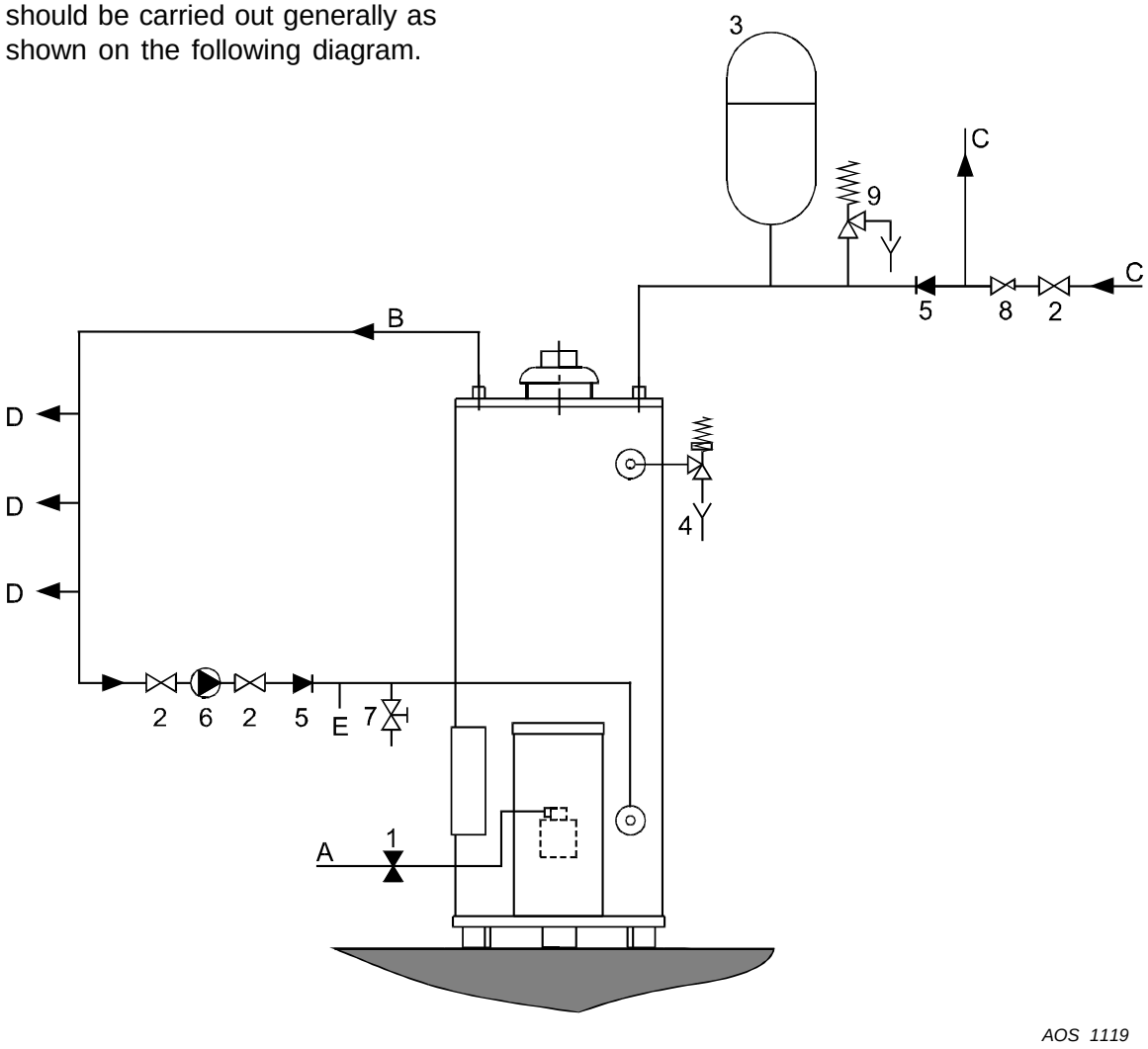
Unvented system (See figur 5)
To install an A.O. Smith water heater on an unvented cold water supply system a kit of valves and fittings fisted by the water reseach centre and complying with part G3 of the current building regulations should be used. Installation should be carried out generally as shown on the following diagram.



Figur 5 - Connection diagram unvented systems

1) Manual gas valve
2) Stop valve
3) Expansion vessel
4) T&P safety valve
5) Non return valve
6) Circulation pump
7) Drain valve
8) Pressure reducing valve
9) Expansion valve

A) Gas supply
B) Hot water outlet
C) Cold water inlet
D) Hot water taps
E) Return circulation

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2.1.3 Gas connection

The gas supply to this appliance must be installed in accordance with BS 6891 (1988) and British Gas Publications UP1 and UP2.
Fit the 1/2" gas supply cock supplied with this unit immediately before the gas control. No heat or soldered joints should be applied in the vicinity of the gas control, as they could cause damage to the control. All connections and joints should be tested for gas soundness with a suitable leak detector (do not use a naked flame).
N.B. When operating this unit on LPG a suitable gas supply cock should be used.

2.1.4 Flue system

The water heater should be fitted with a flue system connected to the draught diverter. The flue pipe should rise for at least 50 cm. vertically before the inclusion of any bends. If a horizontal run of flue is required this should be kept to the minimum lenght possible and incorporate a rise of 6 cm. per metre of run. A split clip or flange should be provided in the flue close to the draught diverter for ease of servicing.
All flue materials should be corrosion resident i.e. stainless steel or galvanised and must include a tested and apprved terminal to BS 5440 part 1.
If the flue passes through any combustible marerial measures must be taken to protect against the possibility of fire.
All flues must terminate in free air space approx. 1,5 metres from any vertical surface of structure i.e. chimney stacks, roof parapets, etc. If an existing chimney or flue is to be used this should be swept clean and be free of debris before an approved liner is installed and connected to the water heater.

2.1.5 Draught diverter

The appliance has been fitted with a flue down draught safety device. The operation of the safeguard is based on the principle of the **T**hermal **R**eflux **S**afeguard (TRS).
This TRS can be recognized by the copper coloured spiral that is fitted to the lower edge of the draught diverter. The spiral is connected to a thermostat by means of a capillary tube. The wiring of the thermostat must be connected to the thermocouple circuit.

Important

The TRS should never be put out of operation. The reentry of flue gasses may cause poisoning.

2.1.6 Electrical connection

All electrical connections must be carried out in accordance with IEE regulations by an accredited electrical installation company. The appliance must be connected to the mains by means of a permanent electrical connection. A main switch must be fitted in the phase between the permanent connection and the water heater. The feeder cable must have cores of at least 3 * 1.0 mm^2 The connecting clamps for the electricity supply are indicated by the symbol for earth Á, N for neutral and L for live. Always check with a voltage tester if the live and the neutral have been connected correctly in the electricity supply. The electricity supply must comply with the requirements below:

Electrical supply	Frequency	Electrically fused to a minimum of
220/240 V AC	50 Hz	5A

The maximum power consumption is 25 W

See electrical diagram for more information, appendix 1.

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2.2 Commissioning

2.2.1 Filling the water heater

1. Close the drain tap.
2. Open the cold water tap to the water heater and open all taps where hot water can be drained for de aeration. The water heater is filled as soon as cold water flows from all taps.
3. Close all hot water taps.

2.2.2 Putting into operation

1. Check to see if the heater is filled with water by running a little to waste from a hot water tap connected to the heater.
2. Check wether the ON/OFF switch is in OFF-position.
3. Ensure gas supply is fully purged of air and turn on gas cock.
4. Ensure that power has been correctly supplied to the unit. Use a voltage tester to check that the live is to “L” and neutral to “N”. (Flame detection is phase sensitive).
5. When first starting, the controller can be in the lock out condition: depress the reset button to free the control. (After manual reset, an extended prepurge/waiting time will occur).
6. Switch the ON/OFF switch into ON position. If the pilot fails to ignite within 25 seconds the controls will go to lock out and the reset button will need to be reset (wait 15 seconds before attempting reset). It may be necessary to repeat the lighting sequence a number of times on the initial light up if all the air has not been purged from the gas supply.
7. The main burner pressure has been factory set but should be checked once normal operation is established (see ‘Ratings’ for settings).
8. Set the temperature regulator to the required setting (see ‘Descalcification’).

Note: If during normal use the reset button is pressed the gas valves will close and the automatic ignition controller will start a new sequence after releasing the reset button.

2.2.3 Shut down

Note:The water heater should only be turned off when hot water will not be required for an extended period (e.g. holidays); otherwise it should be left on. To shut down put the ON/OFF switch into OFF position.

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2.3 Removing and replacing the control panel front cover

Removing the cover (see figure 7)

1. Remove the screw at the top centre of the control panel.
2. Push the cover upwards until the hooks at the lower end clear the burner access opening and base tray.
3. Pull the lower end of the cover slightly forward.
4. Pull the cover down until the top edge is clear of the control panel and then remove.

Replacing the cover (see figure 7)

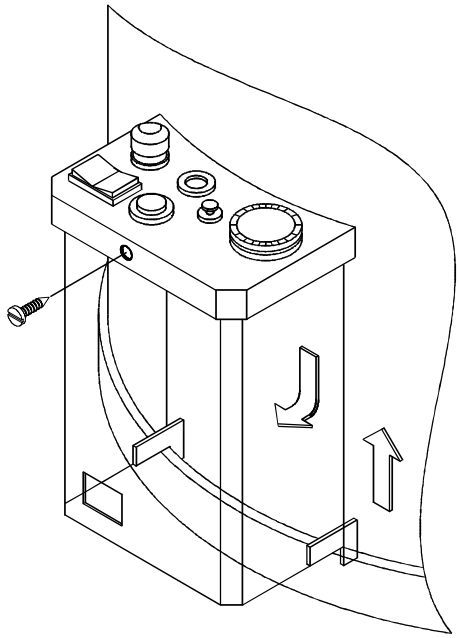
1. Place the top of the cover inside the rim of the control panel and push it up as far as possible.
2. Position the bottom hooks inside the burner access opening and over the rim of the base tray.
3. Push the cover downwards until the lower hooks engage and the top screw holes align.
4. Replace the screw in the top centre of the cover.

2.4 Setting the gas pressure

The gas pressure has been set to the correct values at the factory.

<u>Important:</u> The following procedure must be followed when checking or setting the gas pressure:

1. Shut down the heater by switching off the mains current (switch off main switch);
2. Connect a manometer to the pressure test nipple to measure the burner pressure on the gas control.
3. Activate the heater and allow the burner to ignite;
4. Check the burner pressure. If necessary, reset it by means of the burner pressure adjusting screw. Turning it anti-clockwise reduces burner pressure. Turning it clockwise increases burner pressure;
5. Shut down the heater, remove the manometer and close the pressure nipple;
6. Restart the heater (test for soundness).



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Figur 7 taking off and mounting the control panel

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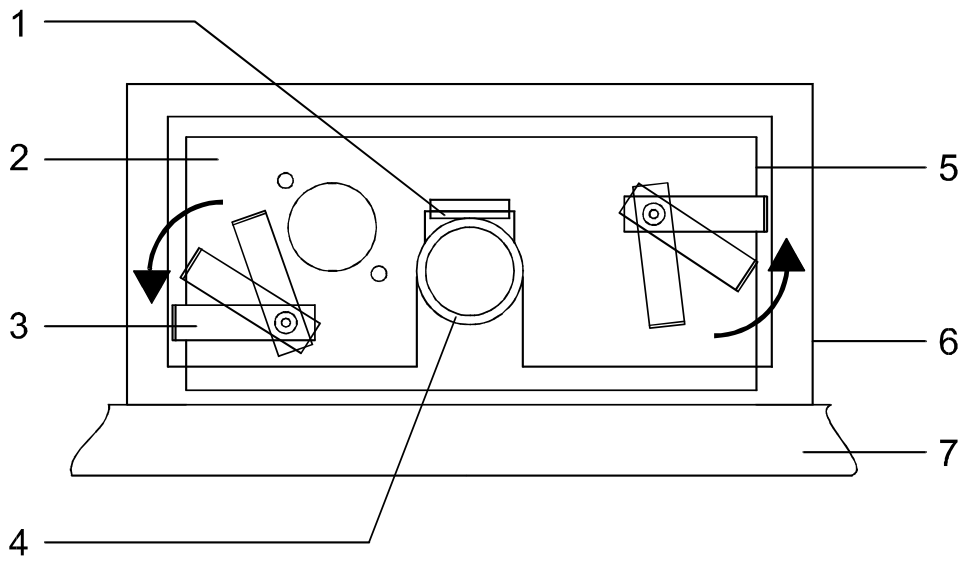
2.5 Mounting the inner door

Mode of operation: (see figur 8).

1. Place the clips in the position on the inner door so the door can fullty stick into the opening.
2. Lift the door up and rotate it over the burner into position.
3. Pull the inner door against the inside of the skirt ring.
4. Rotate the clips into postion with a tool.

2.6 Temperature regulation

The appliance is under water supply pressure (maximum 8 bar). The amount of cold water that is added is equal to the amount of hot water used. The gas control block automatically regulates the gas supply. The main burner will ignite as soon as a reduction in water temperature is sended by the thermostat. The main burner will shut down as soon as the preset temperature is achieved.
At high water temperatures there is more scale buildup in the appliance. It is for this reason that it is recommended to place the temperature control knob in position of
60 °C as the accumulation of scale will be reduced.



Figur 8 Removing and replacing the inner door.

1) Burner bracket
2) Inner door
3) Clip
4) Mainburner
5) Skirt ring
6) Outer casting
7) Base tray

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2.7 Converting to another type of gas

For conversion of the appliance from natural gas to another type of gas, or visa versa, it is necessary to exchange the pilot injector and the main injector. The conversion may only be executed by a qualfied competent person.

Procedure:
1. Shut the heater down. Close the main inlet gas valve and switch off the electricity supply at the main switch;
2. Remove the burner assembly;
3. Replace the injectors with the correct injectors from the conversion set. (see table below).

Remark:
- When conversion of the appliance from natural gas to another type of gas, fix the screw on the gas block of the burner pressure control as far as the stop.

- When conversion of the appliance from another type of gas to natural gas, then the right burner pressure should be adjust.

2.8 Maintenance

To ensure safe and efficient operation of the water heater it is recommended that it is cleaned and serviced at least once a year by a qualified competent person.

2.8.1 Magenesium anode

The life cycle of the anode is determined by the quality and the quantity of the water flowing through the water heater. It is therefore recommended that the anode be inspected and replaced if necessary at least once a year.
1. Close the stop cock in the cold water supply pipe;
2. Open the nearest hot water tap in order to allow the pressure to drop from the water heater and the pipes;
3. Slacken the anode with a fitting wrench;
4. Check the anode and replace it if it has been reduced in diameter by 60% or more at any point on its lenght;
5. Check for water leaks.

If is necessary to replace the anode it should be replaced by one of the same type. The type of anode required can be detemined on the basis of the type of the appliance and the serial number.

	unit	BTI 85			BTI 100		
		G20	G30	G31	G20	G30	G31
Supply pressure	mbar	20	30	37	20	30	37
Burner pressure	mbar	11.5	30	37	10.0	30	37
Diameter main injector	mm	3.90	2.30	2.30	4.50	2.35	2.35
Diameter pilot injector	mm	0.56/ 0.41	0.23	0.23	0.56/ 0.41	0.23	0.23

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2.8.2 Cleaning

1. Close the gas supply and demount the burner after it has cooled down
2. Disconnect the burner assembly from the gas control
3. Remove the complete burrner assembly
4. Clean the burner with a soft brush
5. Check the pilot burner and clean it if so required
6. Check the combustion chamber, flue tube and flue baffle and clean these if required

After cleaning of the pilot- and main burner the operation of these should be checked. If necessary the burner pressure should be reset.

2.8.3 Decalcification

Formation of lime scale depends on the quality and quantity of the water used. In addition higher water temperatures lead to more deposit in the appliance. A temperature setting of 60° C is recommended in order to keep the calcification at a low level.
Decalcification should be attempted with the proper means. For extensive information a decalcification instruction is available.

2.8.4 Spare parts

To be able to order spare parts it is important to note the type of appliance as well as the serial number of the appliance. Based on this information the data concerning the spare parts can be determined.

2.9 Inlet combination

Not applicable in U.K. and Ireland.

2.10 Gas smell

Immediately shut the main gas tap. Do not light any fire or switch o any lights, do not use any electrical switches or alarm bells. Open windows. Thoroughly inspect all gas connections and, if the gas smell persists, alert the local gas company and/or your installer.

2.11 Condensation

If the appliance is filled with cold water or if the hot water consumption is very high, condensation of flue gasses will occur on the cold surfaces of the combustion chamber and the flue tube. The water drops will fall on the burner and cause a sizzling noise. This is a normal phenomenon that will disappear as soon as the appliance reaches its normal operating temperature.

Important warning

The applicance should never be taken into operation with a closed cold water supply!
Provision should always be made for expansion.

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3. FOR THE USER

3.1 Commisioning

Warning

Installing and commissioning of this water heater should only be carried out by a qualified competent heating engineer.

3.1.1 Filling the water heater

1. Close the drain tap;
2. Open the cold water tap to the water heater and open all taps where hot water can be drained for de aeration. The water heater is filled as soon as cold water flows from all taps;
3. Close all hot water taps.

3.1.2 Putting into operation

1. Check to see if the heater is filled with water by running a little to waste from a hot water tap connected to the heater;
2. Check wether the ON/OFF switch is in OFF-position;
3. Ensure gas supply is fully purged of air and turn on gas cock;
4. Ensure that power has been correctly supplied to the unit. Use a voltage tester to check that the live is to “L” and neutral to “N”. (Flame detection is phase sensitive);
5. When first starting, the controller can be in the lock out condition: depress the reset button to free the control. (After manual reset, an extended prepurge/waiting time will occur);
6. Switch the ON/OFF switch into ON position. If the pilot fails to ignite within 25 seconds the controls will go to lock out and the reset button will need to be reset (wait 15 seconds before attempting reset). It may be necessary to repeat the lighting sequence a number of times on the initial light up if all the air has not been purged from the gas supply;
7. The main burner pressure has been factory set but should be checked once normal operation is established (see ‘Ratings’ for settings);
8. Set the temperature regulator to the required setting (see ‘De-scalcification’).

3.1.3 Use

The appliance is under water supply pressure (maximum 8 bar). The amount of cold water that is added is equal to the amount of hot water used. The gas control block automatically regulates the gas supply. The main burner will ignite as soon as a reduction in water temperature is sended by the thermostat. The main burner will shut down as soon as the preset temperature is achieved.
At high water temperatures there is more scale buildup in the appliance. It is for this reason that it is recommended to place the temperature control knob in position of 60 °C as the accumulation of scale will be reduced.

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3.2 Fault overview

Failure	Possible Cause	Corrective Action
Gas smell		If you smell gas you should immediately close the main gas tap, you should not fight any fire or switch on light. electrical switches or bels. Open windows and immediately contact your installer or the local gas company
Heater is off or does not ignit	Burner automat is in lock condition	Reset burner automat with the RESET button on the top of the collumn
	Blocked chimney	Contact your installer to investigate the cause and rectify it
	Overheat thermostat is engaged	Check control thermostat set at 60 °C. Allow the water to cooldown (open taps). Puts the RESET button at the panel. The heater should now operate. If it does not contact your installer.
	Gas supply shut off	Open the inlet gas valve
Insufficient hot water, or none at all	Temperature set too low	Set water temperature to higher valvue (60 °C recommended)
	Thermal Reflux Safeguard has shut down the heater	After resetting the TRS activate the heater. If this occurs regularly, call your installer
	Overheat thermostat is engaged	Allow the water to cool down (opentaps). Puth the RESET button at the panel.
	Supply of hot water exhausted	Reduce hot water use. Give the heater time to heat the water
	Unindentifiable cause	Switch off the elactricity to the heater, close the inlet gas valve and call your installer
Explosive ignition	Wrong inlet gas pressure and/or burner pressure	Set the correct inlet pressure and/or burner pressure
	Dirty injectors	Clean injectors
Poor flame image	Wrong inlet pressure and/or burner pressure	Set the correct inlet pressure and/or burner pressure
Water leakage	Condensation of (flue) gasses	See chapter “Condensation”
	Leakage from other water heater or pipes in the vicinity	If possible trace the cause and/or call your installer

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4. WARRANTY

The following conditions form the guarantee agreement between A.O. Smith Water Products Company (the warrantor) and the owner of the water heater.

4.1 Guarantee in general

If within one year of the original installation date of the water heater any part or component other than the tank shall prove upon examination by the warrantor or authorised agent to be defective in material or workmanship, the warrantor will exchange such part or component.

4.2 Guarantee of the tank

If within 3 years of the original installation date, the tank fails due to rust or corrosion from the water side, the warrantor will supply a complete new water heater of equivalent size and duty (excluding delivery and installation charges). On the replacement water heater a guarantee will be granted sufficient to cover the ubexpired portion of the original 3 years guarantee of the originally installed water heater.

4.3 Conditions for installation and use

The guarantee applies to the heater only while it remains in its original location, and is installed in accordance with local plumbing and building regulations and all relevant Codes of Practice.

The water heater should alse have been used only:

a) for potable water free to circulate at all times and with the tank free of damaging scale deposits;
b) at temperatures not exceeding the maximum setting of its thermostat and ECO (Energy Cut Off device);
c) At water pressures and/or energy inputs which do not exceed those stated on the rating plate of the water heater;
d) in a non corrosive atmosphere or area;
e) with an approved temperature and pressure relief valve of adequate capacity not exceeding the working pressure rating shown on the water heater, and installed in conformity with A.O. SMITH Water Products Companies installation instructions;
f) when anode(s) have been inspected and renewed, if they are worn or erroded by 50% or more at any point of their length.

4.4 Exclusions

The guarantee will be null and void:

a) if the water heater has been damaged by an external cause;
b) in case of misuse, neglect (including frost damage) or incorrect use of the water heater;
c) in case of unauthorised alteration, modification or repair;
d) in case of ingress into the water heater of chemicals, pollutants or contaminants;
e) if the hardness of the incoming water is, or has been, softened below 60 ppm $CaCO_3$;
f) if the water heater is effected by corrosive vapours such as those found in hairdressers, dry cleaners and laundries or where some industrial degreasing products are used and stored (for further information and advise please contact the A.O. SMITH technical Department).

4.5 Range of guarantee

All replacement water heaters supplied under the terms of this warranty will be supplied ex stock on a F.O.B basis. A.O. SMITH accepts no responsability for carriage, labour or other installation costs.

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4.6 Claims

Any claims under this warranty should be initiated with the dealer who originally sold the water heater or with any other dealer or stockist of the warrantors products.

4.7 No other guarantee or warrantee either expressed or implied is made on behalf of A.O. SMITH Water Products Company

With respect to the water heater in question further A.O. Smith does not guarantee this water heater as suitable for purpose except within the terms of warranty detailed above.

A.O. SMITH Water Products Company will not be liable by virtue of this guarantee or otherwise for damage to any persons or property when arising out of contracts or tort.

The terms of this guarantee do not effect your statutory rights under United Kingdom Consumer Legislation.

This guarantee applies to the following models:
BTI 85 G
BTI 100 G

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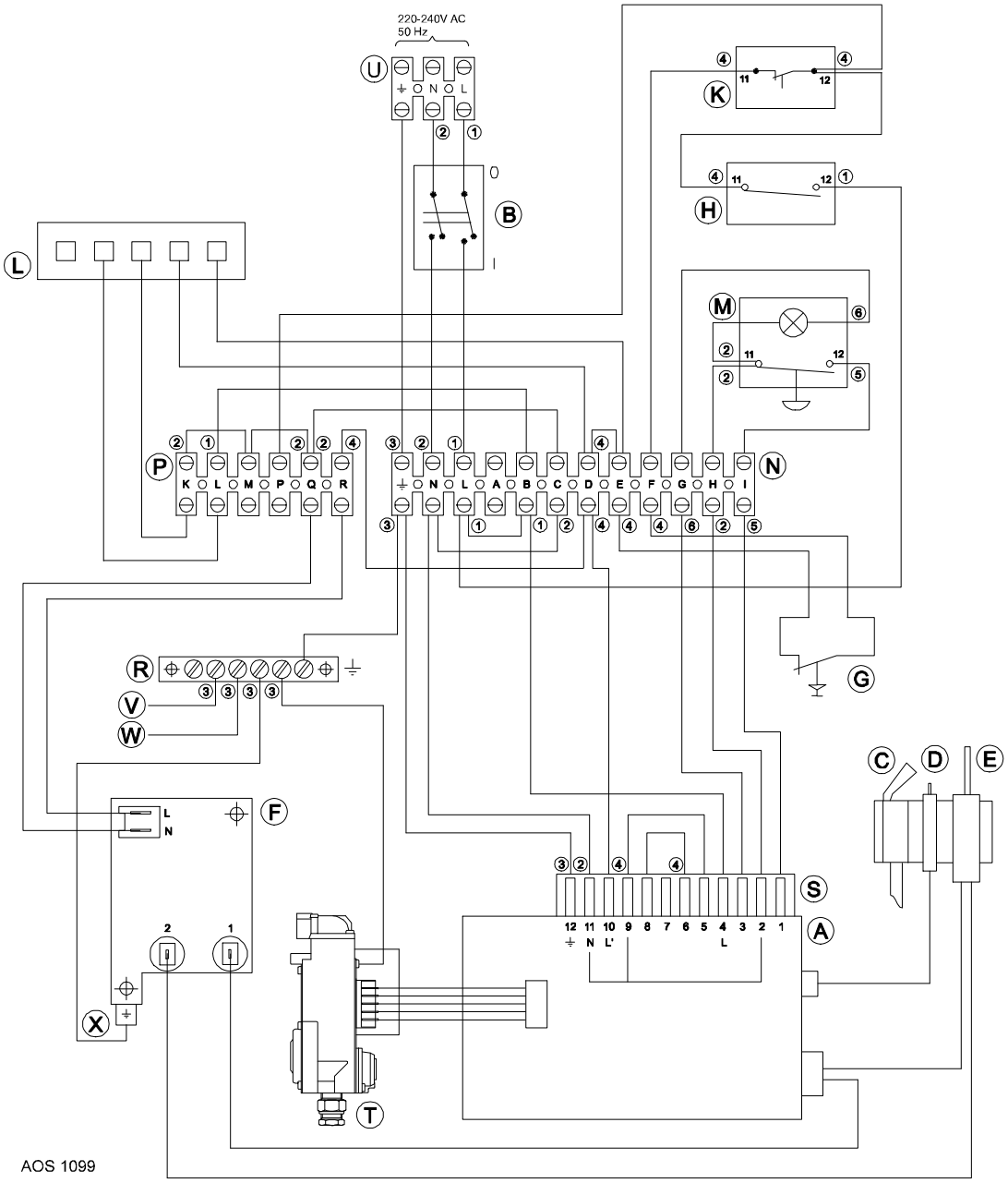
APPENDIX 1 Connection diagram BTI models



① = brown
② = blue
③ = yellow/green
④ = black
⑤ = white
⑥ = red

A = Ignition controller
B = ON/OFF switch
C = Pilot burner
D = Spark electrode
E = Flame probe
F = Transformer flame detection *
G = TRS
H = Control thermostat
K = Safety thermostat
L = Timer *

M = Remote button
N = Terminal block
P = Terminal block
R = Earth terminals
S = Connector
T = Gas control valve
U = Terminal block
V = Tank earth
W = Casting earth
X = Control panel base plate earth

* = Optional

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